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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/064,808	08/20/2002	Ronald Scott Bunker	120478	7768

6147 7590 11/25/2005

GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH
PATENT DOCKET RM. BLDG. K1-4A59
NISKAYUNA, NY 12309

EXAMINER	
PARSONS, THOMAS H	

ART UNIT	PAPER NUMBER
1745	

DATE MAILED: 11/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/064,808	BUNKER, RONALD SCOTT	
	Examiner	Art Unit	
	Thomas H. Parsons	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 August 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31,41 and 42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-31,41 and 42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Response to Arguments

1. Applicant's arguments filed 16 August 2005 have been fully considered but they are not persuasive. The rejections of the claims have been **maintained** as set forth below.

On page 9, paragraphs 1-10, the Applicant argues that Spaeh teaches away from several of the recitations of Claim 1. For Example, Spaeh teaches away from the use of a direct flow channel configured to be in flow communication with the inlet and outlet, as recited by Claim 1. Instead, Spaeh teaches that the supply air is freely guided to the fuel cell stacks within the enclosure. Moreover, also teaches away from the claimed control system, which is configured to control an oxidant flow from the inlet to the direct and bypass flow channels. Namely, Spaeh teaches hat he supply air is freely guided to the fuel cell stacks.

Further, the Applicants argues that it is not clear whether replacing the oxidizing gas bypass valve 9 of JP 10-255827 with the guiding supply air to the fuel cell stacks within the enclosure would render the resulting combination unsuitable for the purpose of JP10-255827, namely stopping power generation in a fuel cell for which an abnormality is detected.

In addition, the Applicant argues that there is not teaching in the cited art suggesting that the resulting combination would include at least one direct flow channel that is defined by at least one fuel cell stack, where the direct flow channel is configured to be in fluid communication with in inlet and outlet of a housing.

In response, JP10-255827 teaches all of the limitations of claims but is silent as to a housing having an inlet and an outlet, the inlet and outlet configured to provide fluid

communication to and from the housing. Spaeh et al. has been relied upon for its teaching in Figures 1 and 2 of a fuel known housing having an inlet and an outlet the inlet and outlet configured to provide fluid communication to and from the housing.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the fuel cell assembly of JP10-255827 by incorporating the housing of Spaeh et al. because Spaeh et al. teach that it is known to enclose a fuel cell within a housing and Spaeh et al. teach a housing that would have provided thermal isolation and a leak proof environment thereby improving the overall efficiency and performance of the fuel cell assembly.

Further, combining the fuel cell features of JP10-255627 including the direct flow channels ($6^{1\text{-}N}$, $7^{1\text{-}N}$), bypass flow channels ($8^{1\text{-}N}$, $9^{1\text{-}N}$), and control system (5) of JP10-255827 with the housing of Spaeh et al. would obviously provide a direct flow channel that is defined by at least one fuel cell stack, where the direct flow channel is configured to be in fluid communication with an inlet and an outlet of a housing.

On page 14, paragraph 3, the Applicant argues that the Examiner has not pointed to any specific teaching in the art to employ an invasive temperature sensor, which is in intimate contact with a downstream control point. Nor has the Examiner pointed to any specific teaching in the art to employ a non-invasive temperature sensor, which is in remote communication with an upstream control point.

In response, it would have been within the skill of one having ordinary skill in the art of temperature sensors to select and locate the appropriate sensor for temperature control depending

upon the desired accuracy of temperature readings, the media to be measure (solid, liquid or gas), and the environmental conditions into which the sensor is to be subjected.

On page 15, paragraph 5, the Applicant states that claim 16 recites a bypass flow channel configured to recycle at least a portion of the oxidant flow through the bypass flow channel inlet, and that Scheffler is directed to a cathode flow control for recirculating cathode exhaust. Applicant argues that Scheffler does not supply the claimed bypass flow channel.

In response, the recitation "configured to" perform a function is not a positive limitation but only requires the ability to so perform. Accordingly, because the fuel cell assembly and in particular, the bypass flow channel of the JP10-255827 combination structurally similar to what is instantly disclosed, the bypass flow channel appears capable of so performing.

(Previous) DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-4, 9, 12-13, 21-23, 25, and 40-41 rejected under 35 U.S.C. 103(a) as being unpatentable over JP10-255827 in view of Spaeh et al. (5,688,610).

Claim 1: JP10-255827 discloses in Figures 1-3 a fuel cell assembly comprising: an inlet and an outlet and at least one bypass flow channel ($8^{1\text{-}N}$, $9^{1\text{-}N}$), the bypass flow channel being

configured to be in fluid communication with the inlet, the inlet and outlet being configured to provide fluid communication to and from the fuel cell assembly, respectively; at least one fuel cell stack (1^1-1^N) and at least one direct flow channel (via 6^{1-N}, 7^{1-N}), the at least one fuel cell stack comprising at least one fuel cell (1^1), and the direct flow channel being configured to be in fluid communication with the inlet and outlet; and a control system (5), which is configured to control an oxidant flow (3) from the inlet to the direct and bypass flow channels (abstract, and paragraphs [0008]-[0014]).

JP10-255827 does not disclose a housing having an inlet and an outlet and defining at least one bypass flow channel.

Spaeh et al. in Figures 1 and 2 define a housing (14) having an inlet (4) and an outlet (4) configured to provide fluid communication to and from the housing, and wherein supply air is freely guided to the cell within the housing which would provide a bypass flow of air (col. 2: 26-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the fuel cell assembly of JP10-255827 by incorporating the housing of Spaeh et al. because Spaeh et al. teach a housing that would have provided an air supply guidance means common to a plurality of fuel cell stacks and is not connected directly with the fuel cell stacks thus providing an easy interchangeably of individual fuel cell stacks thereby improving the overall efficiency and maintenance costs.

Accordingly, the JP10-255827 combination would obviously provide at least one bypass flow channel defined by the housing and an inlet and configured to provide fluid communication to and from the housing.

Claims 2 and 22: The rejection is as set forth above in claim 1 wherein further JP10-255827 discloses in Figures 1-3 a bypass flow channel further configured to be in fluid communication with the outlet (abstract).

Claims 3 and 25: The rejection is as set forth above in claim 1 wherein further JP10-255827 discloses in Figures 1-3 a control system configured to adjust the oxidant flow to the direct and bypass flow channels in response to a feedback signal (i.e. abnormality detecting device 4 is inputted to a bypass and direct control valve) (abstract).

Claim 4: The rejection is as set forth above in claim 1 wherein further JP10-255827 discloses in Figures 1-3 a control system comprising: at least one flow regulator (11^1, 9^1), which is configured to regulate the oxidant flow to the direct and bypass flow channels; a flow controller (5), which is configured to receive the feedback signal and to actuate the at least one flow regulator; and at least one control sensor (4), which is configured to supply the feedback signal to the flow controller.

Claim 9: The rejection is as set forth above in claim 1 wherein further JP10-255827 discloses in Figures 1-3 a flow regulator comprising at least one control valve (11 and 9).

Claim 12: The rejection is as set forth above in claim 1 wherein further Spaeh et al. disclose an outlet configured to be in fluid communication with a subsequent inlet of a subsequent fuel cell assembly (col. 3: 26-39 and Figure 3)

Claim 13: The rejection is as set forth above in claim 1 wherein further JP10-255827 discloses in Figures 1-3 an inlet configured to be in fluid communication with a preceding outlet of a preceding fuel cell assembly.

Claims 21 and 23: JP10-255827 discloses in Figures 1-3 a fuel cell assembly comprising: an inlet and an outlet, the inlet and outlet being configured to provide fluid communication to and from the fuel cell, respectively; at least one bypass flow duct ($8^{1\text{-}N}$, $9^{1\text{-}N}$) and configured to be in fluid communication with the inlet; at least one fuel cell stack (1^{1}-1^{N}) disposed within the housing and defining at least one direct flow channel (via $6^{1\text{-}N}$, $7^{1\text{-}N}$), the at least one fuel cell stack comprising at least one fuel cell (1^{1}), and the direct flow channel being configured to be in fluid communication with the inlet and outlet; and a control system (5), which is configured to control an oxidant flow (3) from the inlet to said direct flow channel and the bypass flow duct; and wherein the bypass flow duct extends along an outer wall of the housing (abstract, and paragraphs [0008]-[0014]).

JP10-255827 does not disclose a housing having an inlet and an outlet and defining at least one bypass flow channel.

Spaeh et al. in Figures 1 and 2 define a housing (14) having an inlet (4) and an outlet (4) configured to provide fluid communication to and from the housing, and wherein supply air is freely guided to the cell within the housing which would provide a bypass flow of air (col. 2: 26-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the fuel cell assembly of JP10-255827 by incorporating the housing of Spaeh et al. because Spaeh et al. teach a housing that would have provided an air supply guidance means common to a plurality of fuel cell stacks and is not connected directly with the fuel cell stacks thus providing an easy interchangeably of individual fuel cell stacks thereby improving the overall efficiency and maintenance costs.

Accordingly, the JP10-255827 combination would obviously provide at least one bypass flow channel defined by the housing and an inlet and configured to provide fluid communication to and from the housing.

Claim 40: JP10-255827 discloses in Figures 1-3 a fuel cell assembly comprising: an inlet and an outlet and at least one bypass flow channel (8^{1-N}, 9^{1-N}), which is configured to be in fluid communication with the inlet and the outlet, the inlet and outlet being configured to provide fluid communication to and from the fuel cell assembly, respectively; at least one fuel cell stack (1^1-1^N) and at least one direct flow channel (via 6^{1-N}, 7^{1-N}), the at least one fuel cell stack comprising at least one fuel cell (1^1), and the direct flow channel being configured to be in fluid communication with the inlet and outlet; and a control system (5), which is configured to control an oxidant flow (3) through the direct and bypass flow channels (abstract, and paragraphs [0008]-[0014]).

JP10-255827 does not disclose a housing having an inlet and an outlet and defining at least one bypass flow channel.

Spaeh et al. in Figures 1 and 2 define a housing (14) having an inlet (4) and an outlet (4) configured to provide fluid communication to and from the housing, and wherein supply air is freely guided to the cell within the housing which would provide a bypass flow of air (col. 2: 26-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the fuel cell assembly of JP10-255827 by incorporating the housing of Spaeh et al. because Spaeh et al. teach a housing that would have provided an air supply guidance means common to a plurality of fuel cell stacks and is not connected directly

with the fuel cell stacks thus providing an easy interchangeably of individual fuel cell stacks thereby improving the overall efficiency and maintenance costs.

Accordingly, the JP10-255827 combination would obviously provide at least one bypass flow channel defined by the housing and an inlet and configured to provide fluid communication to and from the housing.

Claim 41: The rejection of claim 41 is as set forth above in claim 4.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP10-255827 in view of Spaeh et al. as applied to claims 1-4 above, and further in view of JP7-249419.

JP10-255827 and Spaeh et al. are as applied, argued, and disclosed above and incorporated herein.

Claims 5 and 6: The JP10-255827 combination does not disclose a control sensor (abnormality detecting device) configured to monitor a parameter selected from the group consisting of temperature, voltage, electrical current, and heat flux; and, wherein said control sensor comprises a temperature sensor.

JP7-249419 discloses a control sensor (abnormality detecting device) configured to monitor temperature and, wherein the control sensor comprises a temperature sensor (a thermocouple)(paragraph [0077]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the control sensor of the JP10-255827 combination by incorporating the control sensor of JP7-249419 because JP7-249419 teaches a control sensor that would have provided a means for eliminating the temperature distribution within a fuel cell thereby stabilizing cell performance and proloning cell lifetime.

5. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP10-255827 in view of Spaeh et al. as applied to claims 1-4 above, and further in view of JP7-249419 as applied to claims 5-6 above, and further in view of Applicants' admitted prior art.

JP10-255827, Spaeh et al. and JP7-249419 are as applied, argued, and disclosed above, and incorporated herein.

Claims 7 and 8: The JP10-255827 combination does not disclose an invasive temperature sensor and a non-invasive temperature sensor.

The Applicant discloses in paragraph [0025] known invasive temperature sensors, which are in intimate contact with a downstream control point, and non-invasive temperature sensor, which are in remote communication with an upstream control point.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention made to have modified the control sensor of the JP10-255827 combination by incorporating the control sensors of the Applicants' admitted prior art because the Applicant discloses known control sensor that would have provided temperature detection at an upstream

control point and a downstream control point thereby providing a means for improving the overall operating efficiency and control of the fuel cell.

6. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP10-255827 in view of Spaeh et al. as applied to claims 1 and 2 above, and further in view of EP0374368.

JP10-255827 and Spaeh et al. are as applied, argued, and disclosed above, and incorporated herein.

Claims 14 and 15: The JP10-255827 combination does not disclose a housing configured to be pressurized, and wherein the inlet is configured to be in fluid communication with a preceding outlet of a turbine engine, and wherein the outlet is configured to be in fluid communication with a subsequent inlet of a turbine engine.

EP0374368 in the Figure discloses a housing (20) configured to be pressurized, and wherein the inlet (to cathode 12) is configured to be in fluid communication with a preceding outlet of a turbine (16) engine (via compressor 10), and wherein the outlet is configured to be in fluid communication with a subsequent inlet of a turbine engine (16) (col. 3: 6-8 and 22-25) (See also col. 3: 1-col. 4: 15).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the apparatus of the JP10-255827 combination with the pressurized housing and turbine of EP0374368 because EP0374368 discloses a pressurized housing and turbine that would have provided a pressurized environment for electrochemically

reacting a pressurized oxidant stream thereby improving the overall operating efficiency and power density of the fuel cell.

7. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP10-255827 in view of Spaeh et al. as applied to claim 1 above, and further in view of Scheffler et al. (4,859,545).

JP10-255827 and Spaeh et al. are as applied, argued, and disclosed above, and incorporated herein.

Claim 16: The JP10-255827 combination discloses a bypass flow channel but not a bypass flow channel configured to recycle at least a portion of the oxidant flow through the bypass flow channel to an inlet.

Scheffler et al. in the Figure disclose a bypass flow channel (24) configured to recycle at least a portion of the oxidant flow through the bypass flow channel to an inlet (18).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the apparatus of JP10-255827 by incorporating the bypass flow channel of Scheffler et al. because Scheffler et al. teach a bypass flow channel that would provided a means for regulating the total oxygen content entering the cathode side of a fuel cell when the stack is operating at partial power levels thereby improving the overall performance of the fuel cell stack.

Further, it would have been within the skill of one having ordinary skill in the art of process control and feedback systems to modify the apparatus of the JP10-255827 combination

to provide the configuration to recycle at least a portion of the oxidant flow through the bypass flow channel to an inlet.

8. Claims 17, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP10-255827 in view of Spaeh et al. as applied to claim 1 above, and further in view of Applicant's admitted prior art.

JP10-255827 and Spaeh et al. are as applied, argued, and disclosed above, and incorporated herein.

Claims 17, 19 and 20: The JP10-255827 combination discloses a fuel cell system but does not disclose cells selected from the group consisting of a solid oxide fuel cell, a proton exchange membrane fuel cell, a molten carbonate fuel cell, a phosphoric acid fuel cell, an alkaline fuel cell, a direct methanol fuel cell, a regenerative fuel cell, a zinc air fuel cell, and a protonic ceramic fuel cell; wherein said at least one fuel cell stack comprises a plurality of planar fuel cells arranged in a stack; and, wherein said at least one fuel cell stack comprises a plurality of fuel cells arranged in a tubular configuration.

The Applicant discloses in paragraphs [0002] and [0021] known fuel cells consisting of a solid oxide fuel cell, a proton exchange membrane fuel cell, a molten carbonate fuel cell, a phosphoric acid fuel cell, an alkaline fuel cell, a direct methanol fuel cell, a regenerative fuel cell, a zinc air fuel cell, and a protonic ceramic fuel cell; wherein said at least one fuel cell stack comprises a plurality of planar fuel cells arranged in a stack; and, wherein said at least one fuel cell stack comprises a plurality of fuel cells arranged in a tubular configuration.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the fuel cell system of JP10-255827 combination with known fuel cells as disclosed in the Applicant's admitted prior art because the Applicant discloses known fuel cells of a specific type and configuration that would have provided energy conversion devices that operate at high efficiency and low pollution thereby providing cost advantages.

9. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP10-255827 in view of Spaeh et al. as applied to claim 1 above, and further in view of Applicant's admitted prior art as applied to claim 17 above, and further in view of EP0374368.

JP10-255827, Spaeh et al. and Applicant's admitted prior art are as applied, argued and disclosed above, and incorporated herein.

Claim 18: The JP10-255827 combination does not disclosed a pressure vessel.

EP0347368 in the Figure discloses a housing (20) configured to be pressurized (col. 3: 1-col. 4: 15).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the apparatus of JP10-255827 combination with the pressurized housing of EP0374368 because EP0374368 discloses a pressurized housing that would have provided a pressurized environment for electrochemically reacting a pressurized oxidant stream thereby improving the overall operating efficiency and power density of the fuel cell.

10. Claims 26-27, 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP255827 in view of Spaeh et al. in view of Applicants admitted prior art, and in view of EP0374368.

Claims 26, 27, 30 and 31: The rejection is as set forth above in claim 1. However, the JP10-255827 combination does not disclose a housing configured to be pressurized, and wherein the inlet is configured to be in fluid communication with a preceding outlet of a turbine engine, and wherein the outlet is configured to be in fluid communication with a subsequent inlet of a turbine engine.

EP0374368 in the Figure discloses a housing (20) configured to be pressurized, and wherein the inlet is configured to be in fluid communication with a preceding outlet of a turbine (16) engine, and wherein the outlet is configured to be in fluid communication with a subsequent inlet of a turbine engine (16) (col. 3: 6-8 and 22-25) (See also col. 3: 1-col. 4: 15).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the apparatus of the JP10-255827 combination with the pressurized housing and turbine of EP0374368 because EP0374368 discloses a pressurized housing and turbine that would have provided a pressurized environment for electrochemically reacting a pressurized oxidant stream thereby improving the overall operating efficiency and power density of the fuel cell.

The JP10-255827 combination does not disclose a planar solid oxide cell stack, and a plurality of planar solid oxide fuel cells arranged in a stack.

The Applicant discloses in paragraphs [0002] and [0021] known fuel cells consisting of a solid oxide fuel cell; and, wherein said at least one fuel cell stack comprises a plurality of planar fuel cells arranged in a stack.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the fuel cell system of the JP10-255827 combination with known fuel cells as disclosed in the Applicant's admitted prior art because the Applicant discloses known fuel cells of a specific type and configuration that would have provided energy conversion devices that operate at high efficiency and low pollution thereby providing cost advantages.

18. Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP255827 in view of Spaeh et al., and further in view of Applicants admitted prior art, and further in view of EP0374368, and further in view of JP9-223512.

Claims 28 and 29: JP10-255827, Applicant's admitted prior art, and EP0347368 is as applied, argued, and disclosed above and incorporated herein, and wherein further JP10-255827 discloses control system configured to repeatedly monitor feedback signals and comprising: a flow regulator (11, 9), which is configured to regulate the oxidant flow (3) to the direct and bypass flow channels; a flow controller (5), which is configured to communicate a feedback signal and to actuate the at least one flow regulator, and at least one control sensor (abnormality detector), which is configured to generate the feedback signal from at least one control point and communicate the feedback signal to the flow controller.

The JP10-255827 combination does not disclose a control sensor (abnormality detecting device) configured to monitor temperature wherein said control sensor comprises a temperature sensor.

JP9-223512 in Figure 1 discloses a control sensor (abnormality detecting device) configured to monitor temperature and, wherein the control sensor comprises a temperature sensor (a thermocouple)(abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the control sensor of the JP10-255827 combination by incorporating the control sensor of JP9-223512 because JP9-223512 teaches a control sensor that would have provided a means for measuring temperature and load current variations in a fuel cell thereby providing a means for improving the overall operating efficiency and control of the fuel cell.

11. Claim 10, 11 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP10-255827 in view of Spaeh et al. as applied to claim 1 and 21 above, and further in view of Gillett et al. (6,764,784)

JP10-255827 and Spaeh et al. are as applied, argued, and disclosed above, and incorporated herein.

Claims 10, 11 and 24: the JP10-255827 combination does not disclose a bypass oxidant flow channel extending along an inner surface of the housing, disposed within the housing, or flow liner.

Gillett et al. in Figures 2 and 4 disclose a housing enclosing fuel cell stack assembly modules including flow ducts. Gillett et al. disclose that ducting can be on the sides, top or bottom of the module housing, and any suitable ducting is within the invention. Gillett also discloses that thermal insulation (which has been construed as a flow liner) is disposed within the housing and that ducting disposed between said flow liner and said housing and extends along an inner surface of said housing.

Therefore, it would have been within the skill of the art at the time the invention was made to have modified the housing of JP10-255827 combination by incorporating the housing of Gillett et al. because Gillett et al. teach a housing for a fuel cell module that would have provided a totally pressurized or non-pressurized enclosed system for the fuel cells including direct and bypass ducting and a liner that would have prevented high temperatures at the vessel wall thereby improving the functionality of the system, and overall performance and efficiency of the power generating system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas H. Parsons whose telephone number is (571) 272-1290. The examiner can normally be reached on M-F (7:00-4:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

PATRICK JOSEPH RYAN
SUPERVISORY PATENT EXAMINER

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thomas H Parsons
Examiner
Art Unit 1745

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